

AMENDMENTS

In the drawings:

Please substitute the enclosed 22 sheets of formal drawings (Figures 1 - 23) for the drawings as filed.

In the claims:

Please cancel previously allowed claims 56 - 79, 83 - 86, 96 - 107 and 121 - 134, without prejudice, and insert new claims 135 - 176.

135. A compound represented by the nominal formula:



wherein M is selected from the group consisting of Be, Mg, Ca, Sr, Ba, and mixtures thereof; and $0 < y < 1$.

136. A compound of Claim 135, wherein $0 < y \leq 0.5$.

137. A compound of Claim 136, wherein $0 < y \leq 0.2$.

138. A compound of Claim 137, wherein $0 < y \leq 0.1$.

139. A compound of Claim 135, wherein M is selected from the group consisting of Mg, Ca, Ba, and mixtures thereof.

140. A compound of Claim 139, wherein M is a mixture of metals selected from the group consisting of Mg, Ca, and Ba.

141. A compound of Claim 140, wherein M is Mg.

142. A compound of Claim 141, wherein said compound is represented by the nominal formula $\text{LiFe}_{1-y}\text{Mg}_y\text{PO}_4$; and $0 < y \leq 0.5$.

143. A compound of Claim 142, wherein $0.2 \leq y \leq 0.5$.

144. A compound of Claim 143, wherein said compound is represented by the nominal formula $\text{LiFe}_{0.8}\text{Mg}_{0.2}\text{PO}_4$.

145. A compound of Claim 141 wherein $0.1 < y < 0.2$.

146. A compound of Claim 141, wherein $0 < y \leq 0.1$.

147. A compound of Claim 146 having the nominal formula $\text{LiFe}_{0.9}\text{Mg}_{0.1}\text{PO}_4$.

148. A compound of Claim 140, wherein M is Ca.

149. A compound of Claim 148 having the nominal formula $\text{LiFe}_{1-y}\text{Ca}_y\text{PO}_4$, wherein $0 < y \leq 0.2$.

150. A compound of Claim 149 having the nominal formula $\text{LiFe}_{0.9}\text{Ca}_{0.1}\text{PO}_4$.

151. A compound of Claim 149 having the nominal formula $\text{LiFe}_{0.8}\text{Ca}_{0.2}\text{PO}_4$.

152. A compound of Claim 135 which has an olivine structure.

153. An electrode comprising a compound of Claim 135.

154. An electrode comprising a compound of Claim 139.

155. An electrode comprising a compound of Claim 144.

156. An electrode comprising a compound of Claim 147.

157. An electrode, comprising:

- (a) a binder;
- (b) an electrically conductive carbonaceous material; and
- (c) an active material having the nominal formula $\text{LiFe}_{1-y}\text{M}_y\text{PO}_4$, wherein M is selected from the group consisting of Be, Mg, Ca, Sr, Ba, and mixtures thereof; and $0 < y < 1$.

158. An electrode of Claim 157, wherein $0 < y \leq 0.2$.

159. An electrode of Claim 158, wherein said active material has the nominal formula $\text{LiFe}_{1-y}\text{Mg}_y\text{PO}_4$.

160. An electrode of Claim 159, wherein said active material has the nominal formula $\text{LiFe}_{0.9}\text{Mg}_{0.1}\text{PO}_4$.

161. An electrode of Claim 159, wherein said active material has the nominal formula $\text{LiFe}_{0.8}\text{Mg}_{0.2}\text{PO}_4$.

162. An electrode of Claim 157, wherein said active material is a single phase compound having the nominal formula $\text{LiFe}_{1-y}\text{Ca}_y\text{PO}_4$.

163. An electrode of Claim 162, wherein said active material has the nominal formula $\text{LiFe}_{0.9}\text{Ca}_{0.1}\text{PO}_4$.

164. An electrode of Claim 162, wherein said active material has the nominal formula $\text{LiFe}_{0.8}\text{Ca}_{0.2}\text{PO}_4$.

165. An electrode of Claim 157, wherein said active material has an olivine structure.

166. A lithium battery, comprising:

- (a) a first electrode comprising an active material represented by the nominal formula $\text{LiFe}_{1-y}\text{M}_y\text{PO}_4$, wherein M is selected from the group consisting of Be, Mg, Ca, Sr, Ba, and mixtures thereof; and $0 < y < 1$;
- (b) a second electrode which is a counter-electrode to said first electrode; and
- (c) an electrolyte between said electrodes.

167. A lithium battery of Claim 166, wherein said first electrode is a cathode, and said second electrode is an insertion anode.

168. A lithium battery of Claim 167, wherein said second electrode comprises a metal oxide, metal chalcogenide, carbon, graphite, or a mixture thereof.

169. A lithium battery of Claim 166, wherein $0 < y \leq 0.2$.

170. A lithium battery of Claim 169, wherein said active material has the nominal formula $\text{LiFe}_{1-y}\text{Mg}_y\text{PO}_4$.

171. A lithium battery of Claim 170, wherein said active material has the nominal formula $\text{LiFe}_{0.9}\text{Mg}_{0.1}\text{PO}_4$.

172. A lithium battery of Claim 170, wherein said active material has the nominal formula $\text{LiFe}_{0.8}\text{Mg}_{0.2}\text{PO}_4$.

173. A lithium battery of Claim 169, wherein said active material is a single phase compound having the nominal formula $\text{LiFe}_{1-y}\text{Ca}_y\text{PO}_4$.

174. A lithium battery of Claim 173, wherein said active material has the nominal formula $\text{LiFe}_{0.9}\text{Ca}_{0.1}\text{PO}_4$.

175. A lithium battery of Claim 173, wherein said active material has the nominal formula $\text{LiFe}_{0.8}\text{Ca}_{0.2}\text{PO}_4$.

176. A lithium battery of Claim 166, wherein said active material has an olivine structure.